Claims

[c1] 1. A grommet assembly for use with an elongated member, comprising:
a flexible body portion having a radially inward-facing first sealing surface defining a central aperture sized to receive the elongated member, the flexible body portion having a radially outward-facing second sealing surface, the body portion having an annular cavity formed therein substantially concentric with the central aperture and between the first and second sealing surfaces; and
a biasing member contained in the annular cavity and being configured to exert a radially inward sealing force and partially contract the body portion to press the body portion into sealable engagement with the elongated member.

[c2] 2. The grommet assembly of claim 1 wherein the biasing member is a first biasing member, and further comprising a second biasing member in the annular cavity and concentrically arranged with the central aperture, the second biasing member being biased radially outward.

[c3] 3. The grommet assembly of claim 1 wherein the body portion further includes a plurality of fire-resistant layers molded into the body portion.

[c4] 4. The grommet assembly of claim 1 wherein the body portion is a rubber material containing fire retardants.

[c5] 5. The grommet assembly of claim 1 wherein the body portion includes a plurality of sealing projections extending radially inwardly into the central aperture and configured to sealably engage the elongated member.

[c6] 6. The grommet assembly of claim 1 wherein the body portion includes an access portion that provides access to the annular cavity.

[c7] 7. The grommet assembly of claim 1 wherein the annular cavity is substantially fully sealed with the biasing member contained in the annular cavity.

[c8] 8. The grommet assembly of claim 1 wherein the biasing member is an annular spring.

[c9] 9. The grommet assembly of claim 1 wherein the biasing member is a flat metal

spring.

[c10] 10. A grommet assembly for use with an elongated member extending through an aperture in a structure, comprising:
a flexible body portion having a radially inward-facing first sealing surface defining a central aperture sized to receive the elongated member, the flexible body portion having a radially outward-facing second sealing surface sized to fit in the aperture in the structure, the body portion having an annular cavity formed therein substantially concentric with the central aperture and between the first and second sealing surfaces; and
a biasing member contained in the annular cavity and being configured to exert a radially outward sealing force and press the body portion into sealable engagement with the structure.

[c11] 11. The grommet assembly of claim 10 wherein the body portion includes a pair of spaced-apart opposing engagement flanges extending radially away from the second sealing surface and sized to engage the structure around the aperture, each of the engagement flanges have an engagement rib extending toward each other.

[c12] 12. The grommet assembly of claim 10 wherein the body portion includes a plurality of sealing projections extending radially outwardly between the engagement flanges into the central aperture and configured to sealably engage the structure adjacent to the aperture.

[c13] 13. The grommet assembly of claim 10 wherein the body portion further includes a plurality of fire-resistant layers molded into one side of the body portion.

[c14] 14. The grommet assembly of claim 10 wherein the body portion is a rubber material containing fire retardants.

[c15] 15. The grommet assembly of claim 10 wherein the body portion includes a plurality of sealing projections extending radially inwardly into the central aperture and configured to sealably engage the elongated member.

[c16] 16. The grommet assembly of claim 10 wherein the body portion includes an access portion that provides access to the annular cavity.

[c17] 17. The grommet assembly of claim 10 wherein the annular cavity is substantially fully sealed with the biasing member contained in the annular cavity.

[c18] 18. The grommet assembly of claim 10 wherein the biasing member is an annular spring.

[c19] 19. A grommet assembly for use with an elongated member extending through an aperture in a structure, comprising:
a flexible body portion having a radially inward-facing first sealing surface defining a central aperture sized to receive the elongated member
the body portion having a radially outward-facing second sealing surface sized to fit in the aperture in the structure, and a pair of spaced-apart opposing engagement flanges extending radially away from the second sealing surface and sized to engage the structure around the aperture, the body portion having an internal annular cavity formed therein concentric with the central aperture and between the first and second sealing surfaces;
a first biasing member in the annular cavity and concentrically arranged with the central aperture, the first biasing member being biased radially inwardly and sized to exert a radially inward force on the body portion to press the body portion into sealable engagement with the elongated member; and
a second biasing member in the annular cavity and concentrically arranged with the central aperture, the second biasing member being biased radially and sized to exert a radially outward force on the body portion to press the body portion into sealable engagement with the selected structure

[c20] 20. The grommet assembly of claim 19 , further comprising a plurality of fire-resistant layers molded into the body portion.

[c21] 21. The grommet assembly of claim 19 wherein the body portion is a rubber material containing fire retardants.

[c22] 22. The grommet assembly of claim 19 wherein the body portion includes a

plurality of sealing projections extending radially inwardly into the central aperture and configured to sealably engage the elongated member.

[c23] 23. The grommet assembly of claim 19 wherein the body portion includes a plurality of sealing projections extending radially outwardly between the engagement flanges into the central aperture and configured to sealably engage the structure.

[c24] 24. The grommet assembly of claim 19 wherein the body portion includes an access portion that provides access to the annular cavity.

[c25] 25. The grommet assembly of claim 19 wherein the body portion has a radial split therein extending from the central aperture to one of the engagement flanges.

[c26] 26. The grommet assembly of claim 19 wherein the annular cavity is substantially fully sealed with the first and second spring members contained in the annular cavity.

[c27] 27. The grommet assembly of claim 19 wherein the first and second springs are metal springs.

[c28] 28. An installation assembly, comprising:
a structure having an aperture therethrough;
an elongated member extending axially through the aperture; and
a grommet assembly positioned in the aperture around the elongated aperture, the grommet assembly comprising:

a flexible body portion having a radially inward-facing first sealing surface defining a central aperture sized to receive the elongated member, the flexible body portion having a radially outward-facing second sealing surface facing the structure around the aperture, the body portion having an annular cavity formed therein substantially concentric with the central aperture and between the first and second sealing surfaces; and

a biasing member contained in the annular cavity and being configured to exert a radially inward sealing force and partially contract the body

portion to press the body portion into sealable engagement with the elongated member.

[c29] 29. The assembly of claim 28 wherein the biasing member is a first biasing member, and further comprising a second biasing member in the annular cavity and concentrically arranged with the central aperture, the second biasing member being biased radially outwardly and sized to press the body portion into sealable engagement with the structure around the aperture.

[c30] 30. The assembly of claim 28 wherein the elongated member is a wire bundle.

[c31] 31. The assembly of claim 28 wherein the structure is a wall panel.

[c32] 32. The assembly of claim 28 wherein the body portion further includes a plurality of fire-resistant layers molded into one side of the body portion.

[c33] 33. The assembly of claim 28 wherein the body portion is a rubber material containing fire retardants.

[c34] 34. The assembly of claim 28 wherein the body portion includes a plurality of sealing projections extending radially inwardly into the central aperture and configured to sealably engage the elongated member.

[c35] 35. The assembly of claim 28 wherein the annular cavity is substantially fully sealed with the biasing member contained in the annular cavity.

[c36] 36. The assembly of claim 28 wherein the biasing member is an annular flat spring.

[c37] 37. The assembly of claim 28 wherein the body portion includes a plurality of sealing projections extending radially outwardly between the engagement flanges into the central aperture and configured to sealably engage the structure around the aperture.

[c38] 38. The grommet assembly of claim 28 wherein the body portion further includes a plurality of fire-resistant layers molded into one side of the body portion.

[c39] 39. A grommet assembly made by the process, comprising:
providing an annular-shaped biasing member;
encasing the biasing member in a soluble core material to form generally annular core;
molding a flexible material around the annular core to form a grommet having a grommet body having a radially inward facing first sealing surface defining a central aperture, the flexible body portion having a radially outward facing second sealing surface generally concentric about the first sealing surface, the annular core being encased in the grommet body between the first and second sealing surfaces to form an annular cavity within the body portion;
directing a flow of solvent into the annular cavity;
dissolving the core material within the annular cavity with the solvent flowing into the cavity; and
removing the solvent and the dissolved core material from the cavity with the annular-shaped biasing member remaining in the annular cavity, the biasing member being configured to exert a radially inward sealing force and partially contract the body portion about the central aperture.

[c40] 40. The grommet assembly of claim 39 wherein encasing the biasing member in a soluble core material includes encasing the biasing member in a salt core.

[c41] 41. The grommet assembly of claim 39 wherein directing a flow of solvent includes directing a flow of water into the annular cavity.

[c42] 42. The grommet assembly of claim 39 wherein the biasing member is a first biasing member, and the process further comprising providing a second biasing member, and encasing the biasing member includes encasing the first and second biasing members in a soluble core material to form generally annular core.

[c43] 43. The grommet assembly of claim 39 wherein molding a flexible material includes molding a fire-resistant, rubber-based material around the annular core.

[c44] 44. The grommet assembly of claim 39 wherein directing a flow of solvent into

the annular cavity includes directing a flow of solvent into the cavity through an access hole formed in the grommet body, and removing the solvent and the dissolved core material from the cavity includes draining the solvent and dissolved core material through a drain hole formed in the grommet body.

[c45] 45. The grommet assembly of claim 39 , further comprising molding a fire-resistant fabric layer into the rubber grommet body.

[c46] 46. A method of making a self-sealing grommet assembly, comprising:
providing an annular-shaped biasing member;
encasing the biasing member in a soluble core material to form generally annular core;
molding a flexible material around the annular core to form a grommet having a grommet body having a radially inward facing first sealing surface defining a central aperture, the flexible body portion having a radially outward facing second sealing surface generally concentric about the first sealing surface, the annular core being encased in the grommet body between the first and second sealing surfaces to form an annular cavity within the body portion;
directing a flow of solvent into the annular cavity;
dissolving the core material within the annular cavity with the solvent flowing into the cavity; and
removing the solvent and the dissolved core material from the cavity with the annular-shaped biasing member remaining in the annular cavity, the biasing member being configured to exert a radially inward sealing force and partially contract the body portion about the central aperture.

[c47] 47. The method of claim 46 wherein encasing the biasing member in a soluble core material includes encasing the biasing member in a salt core.

[c48] 48. The method of claim 46 wherein directing a flow of solvent includes directing a flow of water into the annular cavity.

[c49] 49. The method of claim 46 wherein the biasing member is a first biasing member, and the process further comprising providing a second biasing member, and encasing the biasing member includes encasing the first and

second biasing members in a soluble core material to form generally annular core.

[c50] 50. The method of claim 46 wherein molding a flexible material includes molding a fire-resistant, rubber-based material around the annular core.

[c51] 51. The method of claim 46 wherein directing a flow of solvent into the annular cavity includes directing a flow of solvent into the cavity through an access hole formed in the grommet body, and removing the solvent and the dissolved core material from the cavity includes draining the solvent and dissolved core material through a drain hole formed in the grommet body.

[c52] 52. The method of claim 46 , further comprising molding a fire-resistant fabric layer into the rubber grommet body.